

Wetland creation and restoration

Wetland Creation and Restoration Cost Factors: U.S. Army Corps of Engineers

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ABSTRACT

This paper addresses topic-related issues that are specific to the programs of the Army Corps of Engineers in terms of the laws, policies, and regulations that impact us. Then it describes some of the programs used by the Corps for ecosystem restoration.

INTRODUCTION

I work with the Portland district of Corps of Engineers in planning programs and project management grants. In the past I've been the chief of the Economics Section and the chief of the Planning Branch. I don't actually get out on the ground, but I work with a lot of the biologists, hydrologists, and cost estimators. And I work with the public right now, finding out what people's needs are and then seeing if programs or authorities that we have available might help. If we don't have something, I try to find if somebody else out there does. If these individuals or groups need legislation, I determine how we can go about getting that or working with the congressional staffs. We don't lobby, but we tell people what their options are for getting assistance.

LAWS AND POLICIES THAT INFLUENCE OUR COSTS

On this topic, a lot of issues are specific to our programs in terms of the laws, policies, and regulations that impact us. The Corps of Engineers does flood-damage reduction navigations, and ecosystem restoration is on equal footing with those other project focuses for funding. So we do ecosystem restoration, and we do it with local sponsors because we are required to have cost-sharing sponsors in anything that's a new work activity. We are not a granting agency like the Federal agencies are. We can do some creative things: we do in-kind help occasionally, but we can't give money. In fact, we ask local sponsors to give us money to do the projects. These sponsors are required to provide lands, easements, right-of-way, relocations, and disposal areas, and they're also required as sponsors to do the operation, maintenance, repair and

1- Ms. Obradovich passed away before she was able to complete her Workshop paper. The transcript of her oral presentation is provided here. Please contact Martin Hudson (503-808-4703) for further information on Corps activities.

rehabilitation. Eventually, the project gets turned over to the local sponsor.

- *Land:* This tends to be biggest item in our cost estimates and anything else that we're doing. In fact, one of our policy issues is that land should not be more than 25% of the total project costs. The Corps is not a land acquisition agency; we manage our project lands, but we're not in the business of acquiring land. Of course, policies can be waived and changed, but in general if a project involves an intensive land cost, we may not be able to play.

- *Monitoring:* Again, this is a policy issue. No more than 1% of restoration cost should go for monitoring. When this policy came out this year, people nationwide questioned the number. Monitoring also cannot continue more than five years after construction. Our guidance tells us that we should be looking at adaptive management, especially for very large projects, and that should be no more than 3% of total project costs. Again, I don't know what those percentages are based on or if they are solely an attempt to keep costs down, as we're using Federal dollars on these projects.

- *Real estate costs:* For Corps projects historically, we want to see property titles. For restoration projects now, people are more willing to go to easement or something less than fee title if it's economically warranted and it makes sense, although sometimes easements can be as costly as a fee title.

- *Other tools and resources:* A list of studies and reports from the Evaluation of Environmental Investments Research Program is available on the Internet or through the Institute of Water Resources (IWR). Again, they may be of special interest to economists. These are not applicable in every case, but there are some things to

consider and there are some good illustrations of National Review Corps Environmental Projects, etc. The IWR is located in Virginia and the Waterways Experiment Station is in Vicksburg, Mississippi, so there is a lot of expertise that we can draw on nationwide. One tool we have is the IWR Plan for environmental restoration. This tool does cost-effectiveness analysis and incremental cost analysis to help us answer questions about whether the project is worth it or which is the best investment of a number of alternatives. The tool can also be downloaded off the Web. There are also people available to help answer questions; they'll even come out and do demonstrations for groups that want to apply it to a project.

CORPS OF ENGINEERS PROGRAMS AND AUTHORITIES USED FOR RESTORATION

Two study programs are available that can lead to projects.

General Investigations Program

The General Investigations Program (Table 1) is for comprehensive basin-wide watershed efforts. It involves a long time frame, but the good feature is that on occasion it can bring about 65% Federal funds to the project and there is no limit on the Federal cost side. This is something to consider for a very large-scale area, such as the Puget Sound area, where I know they're doing some work. This method is slow in that it requires both congressional authorization and appropriation even to start the study process; i.e., one can get an authority from one bill but not have any money to start, so it might take a while to make that happen.

This is a two-phase study process. The first is all at Federal expense. The second phase is cost-shared 50-50 with a local sponsor. This latter may impact the ability to do good planning as there will be pressure to

Table 1. USACE programs for restoration: General Investigations Program

- Best for comprehensive basin-wide watershed efforts of multiple problems
- Requires Congressional authorization and appropriation to initiate
- Reconnaissance Study
- \$100,000 all Federal expense
- Sponsor cost shares feasibility phase of the study (50/50)
- Requires project authorization and appropriation

keep costs down in the planning stages too, since the dollars belong to the sponsor as well. There's a certain amount of negotiation, but there is a trade-off between getting good surveys and good information versus trying to get into the next phase of the effort. Once the feasibility stage is completed, which includes all your NEPA compliance, etc., the applicants have to go back to Congress again for authorization and project appropriation. So to get from the start of the study to implementation sometimes can take 5–10 years. That's the reality.

We actually have authorization and appropriation now to start a study on the lower Columbia River for ecosystem restoration. Initially the States of Oregon and Washington had signed on and some interested local sponsors, but I think it's going to take a lot of sponsors and a lot of effort to make that come together and really do something good in the lower estuary.

Continuing Authorities Program for Restoration

Table 2 describes the Continuing Authorities Program, so-called because Congress has delegated the authority to the

Table 2. Corp programs for restoration: Continuing Authorities Program

Section 1135 — Project Modifications for Environmental Improvement

Section 206 — Aquatic Ecosystem Restoration

Section 204 — Beneficial Use of Dredged Material

- Authority and funding delegated to the Corps
- Smaller scope projects
- Statutory limit on Federal costs
- Cost sharing — generally 65/35
- Sponsors can be NGOs for ecosystem restoration
- Single planning and design process
- 1–3 years from start to construction

Corps of Engineers to manage these programs. Congress provides an appropriation every year for a number of authorities that are specific to ecosystem restoration. Section 1135 addresses modifying either a Corps of Engineers project or Corps of Engineers land to benefit the environment. The second, Section 206, is purely aquatic ecosystem restoration. If you want to do good stuff out there that's wet, you could probably use this authority. Section 204 deals with dredge material disposal for environmental restoration.

These authorities are delegated. They are generally smaller in scope, and they have a Federal cost limit, generally around \$5,000,000 per project. Cost sharing is normally 65/35, with the 65% Federal. So a project of \$6 or \$7 million is possible although most are a lot smaller, generally

\$100,000 to \$500,000. Also, groups like Ducks Unlimited and other NGOs can be sponsors for ecosystem restoration projects. These are more expedited projects that usually take 1–3 years to complete construction.

COST ESTIMATION ISSUES

Cost estimation is only a piece of the puzzle. If one is seeking the biggest “bang for the buck,” a team is needed to look at the formulation and evaluation of projects. Even with a small-scale project, there are many variables and then it’s difficult to move to larger scale and make the kinds of gross assumptions about what will work. One suggestion for ESU watershed-wide assessments is to do a two-phase process with some demo projects to demonstrate success and get some cost information and see what works, then apply what’s been learned to the larger scale.

If we don’t know what the goals and objectives are to begin with, the project is already in trouble. What is it that the group really wants to accomplish? What are the conditions of the existing habitat? What are the limiting factors and what you can do to influence those factors? What are the actions to take to improve habitat? Another issue is real estate. What is the project area? Is the land available? What are the current adjacent uses of that land? We must consider neighbor impacts, or if they are doing something on their adjacent lands that will be detrimental to the project. Zoning and fee title versus easement are also considerations. Is the land even suitable for restoration?

Discussions with multiple contractors are really important. It’s important to find people who know heavy equipment and know the area. Never underestimate the ingenuity of contractors. Bring in experienced people from the beginning who can give their advice and ideas. Get your most experienced staff early on in the process and it will make things a lot better for you.

Permitting costs are a big issue now for the State of Oregon Water Quality Certification for bridge and fill removal, since we have to pay for those certificates based on volume. If the permitting costs haven’t been planned for, it can get pretty expensive pretty quickly. And there must be some estimate for signage. When you allow public access, there is access for only operation and maintenance. You have to think about the kinds of things that have been covered in this Workshop — bond, profit, labor rates, contingencies. Our contingencies are generally 15–25% on the first estimate.

How will you dispose of borrow material? One quote on one acre, 1600 cubic yards is 161 10-yard dump trucks. That’s a lot of material to move and if we don’t know where it’s going, it can be very expensive to get rid of.

Real estate issues are prevalent. Our real estate people do a lot for us, not just in estimating costs and value but, since there is a local sponsor, responsibility to acquire land. We do a lot of work on the real estate side to do appraisals of their estimates and things like that for crediting their cost-share.

Potential relocations can also be really expensive. If we clear an area and someone has utility lines or there are natural gas lines that have to be moved, those things can add up fast and slow the process.

Is there to be passive or active management of the area? What is realistic to expect of the sponsor? Some maintenance, like control of Reed Canary grass, takes a lot of labor every year. And if we don’t think the sponsor can handle it or it will be too costly, we’ve got to really think about what we want to do there.

Is there a relationship between the initial cost and operational and maintenance cost? If we increase initial costs by doing certain things, is there a way to decrease the O&M over the long run so that the average annual cost is lower and you’re not relying as heavily on people doing maintenance over time?

Increasing scale can provide some benefits but, if the project goes into two seasons, the plans involved can get too far away. Costs always go up. And with larger-scale projects, we need to ensure that the pieces of the restoration all fit together to serve the overall goals and that they are not at cross-purposes. This is another area where use of demo projects might be worth considering.

Expanding cost estimators to watershed, ESU or state level seems to be an iffy proposition at best. So iffy must be some sort of cost engineering problem. But that's the same stuff that you've heard.

Resources

We have access to a lot of detailed information in terms of developing cost estimates.

Portland District Corps of Engineers
 Points of Contact:

- Geoff Dorsey, Wildlife Biologist
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- Ron Musser, Real Estate Appraiser
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- Matt Rea, PM-Amazon Creek
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- Doug Putnam, Continuing Authorities
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ACE Examples

• *Trestle Bay located on the lower Columbia River on the Oregon side:* A railroad trestle was constructed here to repair the jetty in the early 1900s. In 1995 working with the State of Oregon, the Parks

Department looked at breaching that trestle and opening up about 600 acres of inner-tidal and sub-tidal habitat to allow movement of fish and other animals as well as export material into the system. The overall cost of the finished project was about \$200,000 including planning and construction. One of the things I wanted to mention is that in our cost estimate, I think they assume that we're taking a contractor in and work between 10–14 days because of weather conditions and things like that. He had it done in 3 days. So they said never underestimate the ingenuity of a contractor.

• *Amazon Creek in Eugene:* We've been working on this project with the City of Eugene, Lane County and Bureau of Land Management (BLM). It's been a long ongoing process and in construction for the last year or two. There is an old flood-control channel that goes through there and some side channels. The project is to take some of the levies, set them back, and expose areas to more of a natural flood-plane condition plus restore between 200–400 acres of wet prairie habitat. About 80 miles of geotextile jute fabric was laid in October of 1999. It's probably one of the biggest projects like that seen.

A couple of key features to note: BLM already had some of the lands as did the City of Eugene. The value of the lands was about \$1.2 million. If they had to acquire the lands, that would have been the end of the project. Also in the planning and design phase, we did not have good survey data. We used aerial surveys and when we went to do excavation, the lands were lower than we thought. This is a complicating factor because we had another wetlands project going on at Fern Ridge near Eugene and we were taking barrow material over to Fern Ridge to do ponds over there and suddenly we had less material than we estimated.

Therefore a miscalculation on one project has an impact on another—a real argument for good survey data.

We also need good people on the site during construction. During the first year I don't think we had an ecologist. Also, one of the key things here was planting and seeds. Native seeds can be a very expensive proposition: one has to think about the timing of where the material is coming from and who's

going to grow it. It's very expensive to have nursery folks doing that, and you've got to make sure you've got it when you need it.

One last issue on this project: monitoring. In our cost estimate, we had \$150,000 for three years for the hydrology aspects of monitoring and then we also had \$200,000 for five years for monitoring the wetlands. That's being managed by the City of Eugene and BLM.

